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ABSTRACT

A prevalent theory about the cognitive aspect of humor is that most humorous stimuli are characterized by incongruity that is first perceived and then resolved. However, the combination of incongruity and resolution is not sufficient for constituting a joke--resolution should be inadequate as well. In other words, resolution is brought about by the receiver's disregard of an essential piece of information that is not explicitly stated but is typically assumed or inferred and that actually makes the initial information unambiguous. Thus, the incongruity only appears to be resolved because the resolution conflicts with valid reasoning made previously. The resolution is seemingly appropriate but virtually inappropriate. A joke is understood when the listener realizes not only the incongruity or its possible resolution, but also the predication of the resolution on overlooked knowledge that seems essential for proper interpretation. In contrast with the concept of a joke, which is a category of stimuli, funniness is a continuum, not a category. Many factors, none of which is either a necessary or a sufficient condition in itself, may contribute to the amount of funniness, independently or interactively. (HOD)

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Technical Report No. 223

THE SEEMINGLY APPROPRIATE BUT VIRTUALLY INAPPROPRIATE: NOTES ABOUT CHARACTERISTICS OF JOKES

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Abstract

A prevalent theory about the cognitive aspect of humor is that most humorous stimuli are characterized by incongruity that is first perceived and then resolved. It is argued here that the combination of incongruity and resolution is not sufficient for constituting a joke. It is proposed here that the resolution should be inadequate as well; in other words, that it is brought about by the protagonist's disregard of an essential piece of information that is not explicitly stated but is typically assumed or inferred and that actually disambiguates the situation. Thus, the incongruity only appears to be resolved because the resolution conflicts with valid reasoning made previously. It is seemingly appropriate but virtually inappropriate. A joke is understood when the listener realizes not only the incongruity or its possible resolution, but also the predication of the resolution on overlooked knowledge that seems essential for proper interpretation. In contrast with the concept of a joke, which is a category of stimuli, funniness is regarded as a continuum.

The Seemingly Appropriate but Virtually Inappropriate: Notes about Characteristics of Jokes

The first problem for the study of humor is what to study first. The question "What is funny?" has fascinated many generations of philosophers and psychologists, but it seems to have eluded the numerous attempts to answer it, probably because judgment of funniness is value-laden and very much influenced by personal taste and subjective experience. Answering such a question appears about as difficult as answering the question "What in a piece of music makes it sound pleasant?" A less intangible goal of the psychology of music is to try, instead, to define the distinctive properties of music in general, or of a certain genre of music.

Accordingly, it may be prudent to focus at present on the relatively modest question of "What is a joke?" A joke may not be funny, and yet in most cases we would have no problem recognizing it as a joke, just as we do not fail to identify a melody as such even when it is unpleasant. Thus, since for that judgment we cannot totally rely on emotions aroused by the stimulus, and since often we cannot fall back on clues from the social context, there must be something <u>in</u> the joke to tell us that it is a joke, some internal characteristics that distinguish the category of jokes from other categories of verbal stimuli, such as stories, fables, dialogues, etc. Why members of this category often elicit laughter is a different issue. How they are rated as more or less funny is still another one. In this paper I elaborate on the defining features of the stimulus

category rather than on the features that make its members vary in funniness, or on the triggering mechanism of the specific reactions they evoke.

What do I mean by the term joke? A formal description is, of course, the end, not the starting point, but first the objects to be described must be isolated. One would naturally like to start from a set of stimuli accepted by most people as jokes, and then find a rule that defines the set of jokes. The problem here is that the word joke is not very well defined in natural language, and people may sometimes disagree as to whether some stimuli are or are not properly called "jokes." To face this problem, I start from a restricted sense of the category that admits just very short stories that are deliberately constructed to elicit laughter or a smile, and that would not be better classed as nonsense. I believe that given this rough description plus a few positive and negative examples, people would be able to sort jokes from nonhumorous stories very reliably, and jokes from other kinds of potentially funny stimuli like nonsense, puns, etc. quite reliably.

Should we, then, try to look for general properties shared by all such jokes? I believe not. The nature of such properties is that they are loose and vague enough to be identifiable post hoc not only in jokes but also in many other stimuli or situations as well. Somewhat ironically, a notable author who tried to specify such a common denominator has himself proclaimed it as ". . . of central importance not only in humour but in all domains of creative activity" (Koestler, 1964, p. 32). I found it more

useful to look for a set of properties that characterizes only jokes, although not necessarily all of them. In other words, rather than looking for universal symptoms, one may try to identify valid symptoms, in the sense that their occurrence in a given utterance suggests to the listener that it is meant as a joke. Some of those properties may turn out to be necessary or to characterize other kinds of humor as well.

Is Humor Explained by Humor Theories?

Theories of humor may be classified in three major classes: superiority theories, refief theories, and incongruity theories (for detailed reviews, see Boston, 1974; Keith-Spiegel, 1972; McGhee, 1979; Piddington, 1933/1963). Theories of the first two classes (e.g., Freud, 1928; Hobbes, 1651; Leacock, 1938; Spencer 1860) ascribe the reaction of humor to emotional, social, or motivational factors. They may be quite pertinent to explaining why jokes are amusing. However, if indeed a joke can be identified, or at least analytically described, independently of the psychological state it produces, then structural aspects of jokes or their processing characteristics must be considered. The third class of theories attempts to isolate such properties. These theories find in jokes elements of incongruity between a concept and a stimulus (". . . incongruity between a concept and the real objects . . ." Schopenhauer, 1819, cited in Piddington, 1933/1963, p. 171), between two juxtaposed elements (". . . incongruous parts or circumstances, considered as united in one complex object . . .," Beattie, 1776, cited in Piddington, p. 167), or

between two possible interpretations of a stimulus (". . . events . . . capable of being interpreted in two entirely different meanings . . .," Bergson, 1911, p. 96; ". . . perceiving of a situation or idea L in two self-consistent but habitually incompatible frames of reference," Koestler, 1964, p. 35). Many of these theories go even further to claim that incongruity is typically revealed suddenly through violation of expectations (e.g., ". . . sudden transformation of strained expectation into nothing," Kant, 1790, cited in Piddington, 1933/1963, p. 168). Since the concept of incongruity emerging from the union of these views is quite vague, it was suggested that its sense be restricted to the perception of the conflict between the expected and the actual ending of a joke, a conflict that typically draws on the existence of an ambiguity in the text or the situation (e.g., Nerhardt, 1976; Rothbart, 1976; Shultz, 1976; Suls, 1972). However, since ambiguity exists in many nonhumorous situations and surprise accompanies many nonhumorous events, it has been recognized lately that incongruity and/or surprise in themselves are not sufficient. A common formulation is that most humorous stimuli are characterized by <u>incongruity</u> that is first <u>perceived</u> and then <u>resolved</u> (e.g., Shultz, 1976; Suls, 1972). The resolution is ". . . a form of problem solving to find a cognitive rule which makes the punchline follow from the main part of the joke and reconciles the incongruous parts" (Suls, 1972, p. 82).

Incongruity accompanied by resolution can presumably be identified in many stimuli or situations. The problem is that there may be too many

incongruities. In other words, not all resolved incongruities are considered jokes. For example, most mystery stories lead the reader to construct an elaborate structure that later collapses in view of some disconfirmed expectations and is superceded by a new structure that accommodates the information better. Yet a mystery story is clearly not a joke.

Also, many jokes are based on an incongruity between expectations set up by one interpretation of a linguistic ambiguity and the punchline, which follows from another interpretation. This is a case of resolved incongruity par excellence. Can this serve as a blueprint for producing jokes? Consider, for example, the syntactically ambiguous sentence:

(1) "I saw the boy with the binoculars."

Since people most often interpret an ambiguous utterance in one way without noticing the ambiguity (Foss, Bever, & Silver, 1968), we could generate both perception and resolution of incongruity by confronting the listener who selected one interpretation with the alternate one. For example, if the listener interpreted the binoculars as a modifier of "the boy," we could add the reply:

(2) "Was he that far away?"

However, this does not seem to be humorous; it would most likely be judged as a natural discourse that contains some grammatical ambiguity; it would not be more humorous if we did not count on the listener's natural biases, but rather lead him to interpret the binoculars as a modifier of "the boy" in the following way:

(3) "What did you see?"

"I saw the girl with the doll and the boy with the binoculars."

"Was he that far away?"

So, the combination of incongruity and resolution is not sufficient for constituting a joke. Is there another ingredient that should be added to the recipe?

A Proposed Model for Jokes

I propose that the resolution should be inadequate; in other words, that it disregards an essential piece of information that actually disambiguates the situation (at least enough to render the resolution implausible).

Consider, for example, the following joke:

(4) A housewife asked her daughter to go to the butcher to see if he had pig's feet. The daughter returned later and said, "I couldn't tell, because the butcher had his shoes on."

This joke draws on the ambiguity of had. It is nowhere made explicit that by saying "had" the mother meant "had for sale" rather than "had as part." However, the word had is only technically ambiguous. There are enough clues in the story to convey to most rational and informed listeners which sense was really meant. The incongruity created by the daughter's bizarre explanation for the failure of her errand is apparently resolved by noticing the alternate interpretation of the mother's request. But actually the incongruity just appears to be resolved, because the "resolution" conflicts with valid reasoning made previously. In other words, it is seemingly appropriate but virtually inappropriate.

The structure of a joke and its processing are sketched in Figure 1. In every joke (at least of the sort being formalized here) there is some ambiguous element: a word, a sentence, a physical environment, a social situation, another person's behavior, etc.; it is ambiguous in the broad sense of being technically open to more than one interpretation. The structural components of most jokes are the setting and the punchline. The setting contains disambiguation cues that strongly indicate one interpretation of the ambiguous element for any person with some assumed state of knowledge. That interpretation establishes some range of expectations about the punchline. However, the disambiguation cues do not preclude alternative interpretations explicitly; the latter are just made insensible in view of stored generic knowledge that must be consulted for the disambiguating potential of the cues to come into effect. Thus, although the expectations set about the punchline are quite firm, they are conditional on some knowledge assumed to be shared by the listener, teller, and protagonist. The disconfirmation of expectations in the punchline tells the listener that the protagonist does not have that knowledge, or does not use it in the same way, or just pretends so.[1] Therefore, the latter has selected an interpretation that would have been ruled out by that implicit knowledge, but which is completely legitimate when that knowledge is absent or ignored. As will be demonstrated later, the requirement that the violation of expectations can be blamed on the absence, disuse, or misuse of knowledge is probably crucial.

Insert Figure 1 about here.

Now we are in a position to explain our failure to manufacture a joke drawing on the grammatical ambiguity in (1). It is possible to bias the listener towards one syntactical interpretation as was done in (3), but this does not make the other one illegitimate. The two interpretations are not equally likely given what we know about the way people normally construct sentences, but they are, nonetheless, equally sensible. Thus, the humorous impact of the punchline is not due to the surprise value of the alternate interpretation it introduces, but rather to its inadequacy. If, after being exposed to the alternate interpretation, the listener may say, "Oh, I didn't think of that, but it is clearly a possibility," he or she would presumably not consider what he or she had heard as a joke, let alone find it funny. So, the adequacy of a resolution is not related to its likelihood, but rather to its compatibility with all the knowledge we bring to bear on the setting.

Is it not more economical, then, just to say that we joke at the inappropriate? I believe not. True, we often find inappropriate behavior funny, but we do not consider it a joke. To constitute a joke, the inappropriate must be offered as a seemingly appropriate resolution to a problem or an apparently legitimate interpretation of a situation or an utterance. The quite unique and fairly general property of the resolution in a joke is that while being clearly inadequate, it is still perfectly adequate when predicated on interpreting the situation with one eye closed, typically the eye with the broader perspective. The resolution is compatible

with most rules of interpretation, yet is rejected by some high-level consideration.

Consider, for example, the following joke:

(5) How would you fit four elephants in a VW bug?

Two in the front seat, and two in the back.

In this joke the solution is apparently legitimate except that it conflicts with our knowledge about reasonable proportions. The overlooking of this type of knowledge is often ridiculed in humor. A behavior that mechanically follows rules that can be made explicit but violates requirements that are hard to specify, like reasonable proportions, is a common motif in nonverbal humor (see Bergson, 1911). Consider, for example, the clown who cracks a nut with a sledge-hammer. But note that the disregard of knowledge about relative size per se is not as important as the flagrant elusion of the assignment implied by the riddle-like structure to solve just that problem. A cartoon showing somebody who actually tries to fit four elephants in a car would have a completely different flavor. The naive "solution" suggested in the punchline is an excellent illustration that the resolution of a joke does appear appropriate in a sense, and that that innocuous appearance is created by ignoring a most essential piece of information which, nonetheless, is not explicitly stated.

Joke Comprehension

In contrast with the two-stage model for joke comprehension advocated, e.g., by Suls (1972), I propose that understanding a joke involves three

elements. A joke is understood when the listener realizes not only the incongruity and its possible resolution, but also that the resolution depends on ignoring knowledge essential for proper interpretation. Thus, to understand the joke, the listener has to locate the source of incongruity. To do this, he or she has to backtrack his processing of the setting and search for an implicit assumption that can be relaxed without conflicting with explicitly stated information, and whose relaxation suffices for accommodating both the setting and the punchline within a new coherent structure. The process of comprehension may be regarded, thus, as a chain of search, relaxation, and coherence testing applied to rules and assumptions considered as candidates for being the source of incongruity.

A listener will not understand a joke if he perceives the incongruity but fails either to find or to re-evaluate that part of the first interpretation which must be interpreted differently in order that the situation can be restructured. Sometimes he may understand it not as intended by the teller, because the search for sources of incongruity self-terminates before the intended source is found. Any resolution that satisfies the conditions that are sufficient for categorizing the stimulus as a joke, funny or not so funny, will probably bring the process of understanding to a halt.

Type of Knowledge Disregarded

How versatile is the class of jokes described by the proposed model? To convey to the reader some feeling for its breadth, I present a few

examples crudely classified by the type of knowledge which is disregarded to enable resolution. Some of the jokes below are not very funny. This does not matter, I believe, as long as they unequivocally qualify as belonging to the category of jokes. It may even be a virtue, because the ingredients that serve to make a joke very funny may sometimes camouflage the underlying structure that makes a joke of it in the first place.

Inappropriate Interpretation of Verbal Communication

There is a growing recognition in psychology, linguistics, and computer science that language cannot be understood without bringing to bear a vast amount of knowledge about semantics and pragmatics; applying only lexical knowledge and syntax rules simply will not do in many cases (see Chafe, 1970; Clark & Clark, 1977, ch. 2, 3; Rumelhart, 1977; Schank, 1973; Searle, 1969; Verbrugge, 1977; Woods, 1975). Many jokes capitalize on errors of interpretation due to such unsophisticated linguistic reasoning, which appears technically appropriate.

Disregard of semantic environment. Semantic cues derived from context may affect the selection of one of the possible meanings of an homonym, or of one of the possible parsings of a sentence, or of one of the possible resolutions of ambiguity of reference (see Rumelhart, 1977). Many jokes draw on a semantically inappropriate reading of an homonymous or polysemous word or word sequence. For example, consider again joke (4). Despite the polysemy of had, its occurrence in the first sentence is disambiguated by the semantic knowledge that butchers have pig's feet for sale but have person's feet as body parts.

Some jokes are based on a grammatical interpretation that is semantically impossible. For example, consider the following home-made jokes, which utilize a well-known grammatical ambiguity:

(6) "See these two old ladies on the bench; they are eating apples."

"Are they? But most of the apples I've seen are not that chatty."

The second sentence imples that the speaker has interpreted the first sentence to mean that persons are apples, which is certainly inappropriate.

Finally, consider the following joke:

(7) "I saw the Grand Canyon flying to New York."

"Did it board the plane at Los Angeles or San Diego?"

The ambiguity of reference with regard to the agent of flying is resolved by our knowledge that canyons cannot fly. If this information is ignored, the results will be humorous.

Literal understanding of metaphors and idioms. A listener can usually easily determine whether an utterance is used literally, metaphorically, or idiomatically (see Ortony, Schallert, Reynolds, & Antos, 1978). The incongruity in some jokes arises because the protagonist interprets an idiomatic utterance in a literal way, as in the following example borrowed from Bergson (1911):

(8) "Don't get involved in the stock market; it is a risky game. One day you win, the other day you lose."

"So, I'll only buy and sell on every other day."

One might argue that metaphoric language is in itself inappropriate in a way, because it disregards some properties associated with the literal sense. Indeed, some readers of previous versions of this article used this argument to contend that inappropriately resolved incongruities are not unique to jokes, since they characterize metaphors as well. My view is that the premise underlying this argument is false. Figurative language is as legitimate and normal in speech and writing as literal language is, and there are some indications that both are processed in basically the same way (see Ortony et al., 1978). Hence, knowledge of how to interpret metaphorical statements or idioms is part of the cognitive armamentarium of every intelligent person. It is the failure to use this knowledge that is inappropriate, since it may be diagnostic of some deficiency in linguistic skills.

Disregard of pragmatic knowledge. A lot of information that is not stated in a text is completed on the basis of nonlinguistic pragmatic knowledge retrieved from memory. Ignoring that knowledge may produce misjudgment of intentions (jokes 9, 10), of expected emotions (joke 11), of perceived social hierarchy (joke 12), etc.

(9) A man eating in a restaurant suddenly jumped up and complained to the waiter, "Look what I found in my soup! A sock!" The waiter replied, "And what did you expect to get for your two bucks? A silk scarf?"

(10) A man fell into the river and started waving his hands and shouting: "Help! I don't know how to swim. Help! I don't know how to swim." Another man passed by and said to him: "Listen, buddy, I don't know how to swim, either, but I don't make such a big deal out of it."

(11) "Sir Chesterfield, I am sorry to tell you that your wife ran away with your chauffeur."

"Never mind, fellow, I know how to drive."

(12) In his youth Oscar Wilde was poor but had a developed sense of self-respect. He was once interviewed by a nobleman who looked for a tutor for his son. The nobleman was inclined to hire him but asked:

"As for meals, Mr. Wilde, do you expect to eat with the family?"

"That," said Wilde calmly, "just depends on the table manners of the members of your family."

In each of these examples, the setting provides sufficient contextual information to suggest a schema that would make a particular phrase unequivocal, but the punchline shows that that phrase is, in fact, ambiguous if that contextual knowledge is disregarded.

A special type of pragmatic knowledge is embodied in rules for inferring intentions from meaning. Grice (1975) pointed out that knowledge about conventions of verbal communication provides a lot of information about the

intended meaning of a message that is not indicated by semantics and syntax. For example, the question

(13) Could you tell me the time?

is not taken literally because of some implicit assumption about the speaker's intent. The discovery that a person has not made this assumption (for example, if he replies, "I suppose I could") restructures the question in a way that is technically legitimate but practically inadequate. Hence, such a reply would sound humorous.

Consider now where-, when-, or why-questions. The amount of information sought is not specified but rather inferred by the listener from his model of the speaker's intent (Norman, 1973). For example, it was pointed out by Rumelhart (Note 1) that the appropriate amount of specification of location information is one level below the smallest geographical unit at which both the place in question and the conversants are located. A cooperative listener should specify exactly that amount of information by Grice's maxim of quantity. The realization that the protagonist of the following joke fails to use this rule, and thus does not comply with Grice's maxim of quantity, appears humorous:

(14) The scene: New York City, Fifth Avenue at 30th St.

A tourist asks a boy who looks localite:

"Where is the Empire State Building?"

The boy answers:

"In America."

One more illustration of the humorous effect of an interpretation compatible with one technically legitimate sense but incompatible with inferred intended meaning is presented below:

(15) A journalist asked Winston Churchill about his opinion on the prediction that in the year 2000 the women will rule the world.

Churchill answered: "Still?"

Grice's maxim of quantity prescribes that had the journalist thought that women ruled the world at the time, he should have himself inserted the word still before the word rule. Churchill's pretended ignorance of that maxim is unexpected and funny. The fact that it is pretended and that it subtly conveys Churchill's opinion about women makes it witty as well.

Inappropriate Interpretation of a Situation

Up to now I have examined jokes that draw on an unexpected and inappropriate interpretation of a verbal message. Other jokes describe verbal or nonverbal behavior or a solution to a problem that disregards an essential aspect of the situation. The setting leads the listener to expect some sort of behavior or solution on the basis of a generally accepted interpretation of the situation. Those expectations are nevertheless disconfirmed in the punchline because the way in which the protagonist interprets the situation, and accordingly, the manner by which he responds to it are a "near miss" (Winston, 1973); namely, it is appropriate

in many regards except for one that is essential. Consider, for example, the insensitivity to proportions exhibited by the solution offered to the question posed in joke (5).

Another implicit but essential bit of knowledge often ignored by protagonists of jokes is the appropriateness of behavior under various conditions, as illustrated in the following examples:

(16) A miser fell off the roof of his three-story house. On his way down he passed the kitchen window where his wife was fixing dinner, and shouted to her: "Make it one person less!"

(17) The scene: An operating room, in the middle of open-heart surgery. The surgeon asked a nurse for a scalpel. The nurse put her hand behind her back and said, "Guess which hand."

The miser in joke (16) continues to exhibit behavior no longer funtional even from his point of view. Similarly, the behavior of the nurse in joke (17) would look just exuberant in other circumstances. We rightfully infer that both the miser and the hurse have misinterpreted the situations.

Discussion

What Inappropriate Does Not Mean

One might wonder whether inappropriate is not just another name for incongruous. It is true that the presently loose manner in which the term incongruity is used permits this understanding of it as well. However, to

be of any use, a scientific term, vague as it may be, must not be ambiguous. I maintain that in the sense in which it is typically used, incongruity is viewed as "a conflict between what is expected and what actually occurs in the joke" (Shultz, 1976, p. 12) that " . . . disappears . . . when the pattern is seen to be meaningful or compatible in a previously overlooked way" (McGhee, 1979, p. 7). In other words, the incongruous parts are seen to be reconciled (see the quotation above from Suls, 1972) by the resolution, probably because it has not been generally realized that the incongruity in a joke cannot be solely due to the existence of two interpretations, one of which is less expected, but rather to the fact that the least expected interpretation is also insensible. Hence, incongruity disappears only on the surface. It is actually not reconcilable, because the resolution is inappropriate. While incongruity is a psychological state that occurs in many situations, the recognition that it results from some inappropriate interpretation is characteristic only of jokes.

Rothbart and Pien (1977) suggest that some jokes are characterized by an incomplete resolution that ". . . introduces a new element of incongruity . . ." that leaves the situation impossible. Rothbart and Pien seem to regard the remaining incongruity as an extra spice that is not essential for the humorous impact. This is clearly true if the impossibility of the situation is taken as a criterion; for example, most of the jokes in this paper depict quite possible, albeit not very plausible, situations. Furthermore, incompleteness per se often characterizes attempts to produce jokes

that do not quite make it, but rather result in some kind of nonsense, for example, if in joke (9) the waiter had replied, "Yeah?! I had expected it to be a hat." As stated earlier, within the class of funny stimuli, the unique property of jokes is that the inappropriateness contained in them is disguised by a seemingly appropriate surface appearance. That is, their resolution must make perfect sense if one or two assumptions are relaxed.

This seems like a good place to warn against conceivable overgeneralization of the term inappropriateness as used in this context. Why is it that we do not consider as humorous any violation of something we know about the world? For example, simply telling about an impossible event, such as an animal that is talking, clearly cannot constitute the punchline of a joke. The reason is that even though the expectations of the listener derived from his or her world knowledge are disconfirmed, he or she cannot ascribe it to misinterpretation due to lack of that knowledge on the part of anybody else. The teller must be lying or telling about an event in an imaginary world. Either way, the teller is aware of the same knowledge as the listener is, and the protagonists seem to obey the laws of the hypothetical world in which they reside. If they do not, that can be a good subject for joking, as in the following joke:

(18) A horse bought a ticket for the theatre. As he entered the hall, he suddnely burst into laughter.

"What is so funny, horse?"

"See who's sitting in the first row: A donkey!"

The essential role of the presence of some misinterpretation is exemplified by the following story, originally suggested as a counter-example by a person who read a previous version of this article.

(19) Jack put a pencil in his pocket, but because it had a hole in it, it fell out. He picked his pocket up and took it to his tailor.

Here, context combined with world knowledge suggest that the referent of the last it in the first sentence is the pencil. We are surprised to find out that despite these considerations, it actually refers to the pocket. Why is (19) not considered a joke? The answer is that we are not introduced to any protagonist who misinterpret a situation or an utterance. The teller tells us about an unlikely (albeit not impossible) event, and we are invited to take it seriously despite two flagrant violations of rules of cooperative communication that lead our expectations astray. It might be different if a protagonist misinterpreted a proper communication as if it were phrased in violation of those rules, as in the following example:

(20) "Bill, perhaps you can help me. Yesterday when I left your office, I put my pencil in my pocket, but because it had a hole in it, it fell out. Did you happen to find it?"
"Sorry, I have not found any pocket."

What Essential Means

Another issue is whether there are any constraints on the type of knowledge that is disregarded to enable the resolution, and if there are,

what are they? It was stated earlier that that knowledge should be essential. What does essential mean? First, it means that knowledge is generic rather than episodic (see Tulving, 1972). Second, it is seldom of such a low level that its absence would preclude any interpretation whatsoever (say, knowledge of a rule of grammar); otherwise the resolution would be impossible. Also, it is often knowledge that helps to resolve ambiguity at a lower level; hence, it cannot be a very low-level knowledge. Third, it is often so taken for granted that we usually do not even realize that we use it; it is the kind of thing a programmer of a cognitive simulation tends to overlook in his first program. Finally, it is the sort of knowledge that the listener would be very ashamed not to have. In other words, lacking it would make him silly rather than just uninformed or imprudent: We seldom joke at the ignorance of the fact that Hebrew is a Semitic language, or at a failure to take into account the possibility that it might be raining shortly. We would more readily joke at, say, the violation of one of Grice's (1975) maxims of cooperative communication, as in joke (15).

These properties do not constitute a formal definition of the meaning of essential because they are vague in themselves. However, I believe that the presence of such properties can be diagnosed quite reliably. Thus, although the theory proposed here does not dispel vagueness, it restricts its locus.

Can we hope ever to specify an objective meaning of essential? Note that not every listener is equally sensitive to the same points. Some listeners lack the knowledge that makes the resolution ridiculous. Their

high-level knowledge is presumably the lower-level knowledge of other listeners. That explains why humorousness is subjective. A joke should be tuned to the sophistication or cultural biases of the listener's system of representation and processing.

The Issue of Sufficiency

Do the characteristics outlined here constitute a recipe that is sufficient for producing stimuli intended as jokes? These characteristics will certainly fail the most stringent test of sufficiency, the generation of funny jokes. That may be difficult not only because of problems of retrieval involved in any creative act, but also because of a simple but often overlooked fact: Funniness qualifies to a variable degree the members of the category of jokes. Thus, funniness in itself is a continuum, not a category. Many factors, none of which is either a necessary or a sufficient condition in itself, may contribute to the amount of funniness, independently or interactively. Those numerous determinants of funniness may be called intensifying factors because they amplify an embryo of funniness ingrained in whatever belongs to the category of jokes. Such factors were proposed by many discussions of humor. Among them one may think of involvement of emotionally arousing cues, relief of tension, proper timing, high familiarity with and high relevance of the reason for misinterpretation on the part of the protagonist, and many others. To construct a theory of how they build up a comic effect or even just to compile a moderately exhaustive list of them ". . . may be a task as delicate as analysing the chemical composition

of a perfume . . ." (Koestler, 1964, p. 61). Hence, this paper focuses just on the defining features of the stimulus category. Dealing with the distinctive features that make its members differ in funniness falls beyond its scope.

Are we ready, then, to devise an algorithm that produces only jokes, funny or unfunny as the case may be? The theory proposed in this article suggests that a short story can be transformed into a joke in the following way: One would have to remove the ending of the story, isolate the generic knowledge that must be used by the protagonist to disambiguate parts of the text that are technically open to more than one interpretation, disregard one piece of such information that is essential, and then create an ending that tells about an action or an utterance of the protagonist that is compatible with the rest of the information, explicit as well as implicit.

While most parts of this procedure are fairly well defined, the major stumbling block is clearly the absence of a formal definition of the attribute essential. Hence, a generation procedure cannot be constructed without affixing to it a clinical judgment of "essentiality."

Can a procedure for producing jokes really work with the aid of this stilt? Consider the following illustration dialogue:

(21) The father told his daughter: "Minnie Mouse put her trust in Bugs Bunny's boat, but there was a crack in the boat, so in the middle of the river it sank."

The Daugher cried: "Poor Minnie!"

The situation, as well as the discourse, are not unrealistic or unreasonable. Now suppose the last word, Minnie, is removed. People who employ their linguistic apparatus properly and who consult their knowledge of the world would probably complete the missing word as it appears in the original. However, people who act on the assumption that the word trust means some kind of animate object will probably insert it as the subject of the daughter's exclamation. By so doing, they naively produce a dialogue that is likely to be perceived as a joke by other people who know the real meaning of the word trust. This demonstration shows that when a response to an utterance takes into account all relevant knowledge save one essential piece, the dialogue may be perceived as a joke.

How likely is this procedure to produce a joke? Unfortunately, not very likely. One reason is quite simple. This procedure focuses on the narrated text proper, and furthermore, just on its semantics. Yet the human mind may pick and utilize many other cues as well. For example, it is common wisdom in psychology that the perception of a given stimulus or the mental state it evokes are affected not only by its own internal properties but also by how the perceiver is set to view it. The listener can often anticipate a joke because of some explicit preparatory cues such as the introductory question, "Heard this one?" or more subtle ones such as the expression on the face of the teller. Even in the absence of external cues, the listener may be relying on structural or stylistic features of the text itself. For example, a joke is usually self-contained; it seldom

makes reference to characters that are part of the context in which it is presented. The presentation of events in a joke is rapid, immediate, and economical in terms of words. Jokes often resort to characteristic openings such as, "A priest, a doctor, and a lawyer travelled together in a train . . ."

Those cues and some others signal the presence of a joke and predispose the listener to treat it as a joke, namely, to look for an inappropriate resolution of a forthcoming incongruity. They might even sometimes bias the listener to judge a nonjoke as a joke. However, it is clear that they are neither necessary nor sufficient. Moreover, I propose that they serve as signals rather than as defining properties. Their absence may sometimes cause the listener to miss a joke, but their presence in any number or amount cannot substitute for a lack of the essence of a joke, which is an inappropriately resolved incongruity. A listener who hears a story that misses an inappropriately resolved incongruity, but that is anticipated or introduced as a joke, will probably feel deceived. This could happen because a signal facilitates the discovery of defining features and even induces the processing system to find them in otherwise ambiguous stimulus constituents, yet it cannot replace them.

A more basic problem with this joke procedure is its tacit assumption that inappropriate interpretation will be reflected in behavior that is incongruous with expectations. Not every failure of understanding brings about a response that reveals it. For example, one may misinterpret <u>trust</u> in (21) to be some kind of animate object and still utter completely

context-compatible phrases, such as "Poor bunny!" or "And what happened then?" etc. Such phrases are clearly undiagnostic of misunderstandings.

Even more problematic is the application of this procedure to any haphazardly selected story or dialogue. It is often surprisingly difficult to systematically uncover hidden assumptions and tacit knowledge that people employ during comprehension. Once we do, we figure that much of that knowledge does not fall under the heading essential. But perhaps the most serious problem is that absence of knowledge may take many forms, and most often several of them may lead to the same outcome. In this case the incongruity created may not be resolvable, because its source may not be traceable. For example, if the little girl in (21) said, "How could it ever get to the middle of the river?" the listener may have a hard time finding out that she said it because she thought a boat was a sort of an automobile. Thus, to be considered inappropriate, the resolution has to be found in the first place. In other words, there must be a way to infer from the punchline what knowledge was missed or disregarded. Hence, the main obstacle for the generation of jokes seems ironically not to be any property which uniquely typifies jokes. It is rather the more general difficulty to compose a story in which a hidden cause can be reliably recovered from its effect. The humorous touch is added when that cause is a disregard of an essential piece of knowledge.

Thus, an algorithm for joke generation is probably far ahead of us, but perhaps not because we are short of specifying a sufficient formula

for a joke. The formula may be quite simple, yet it still takes a human brain to combine the elements.

Reference Note

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Footnotes

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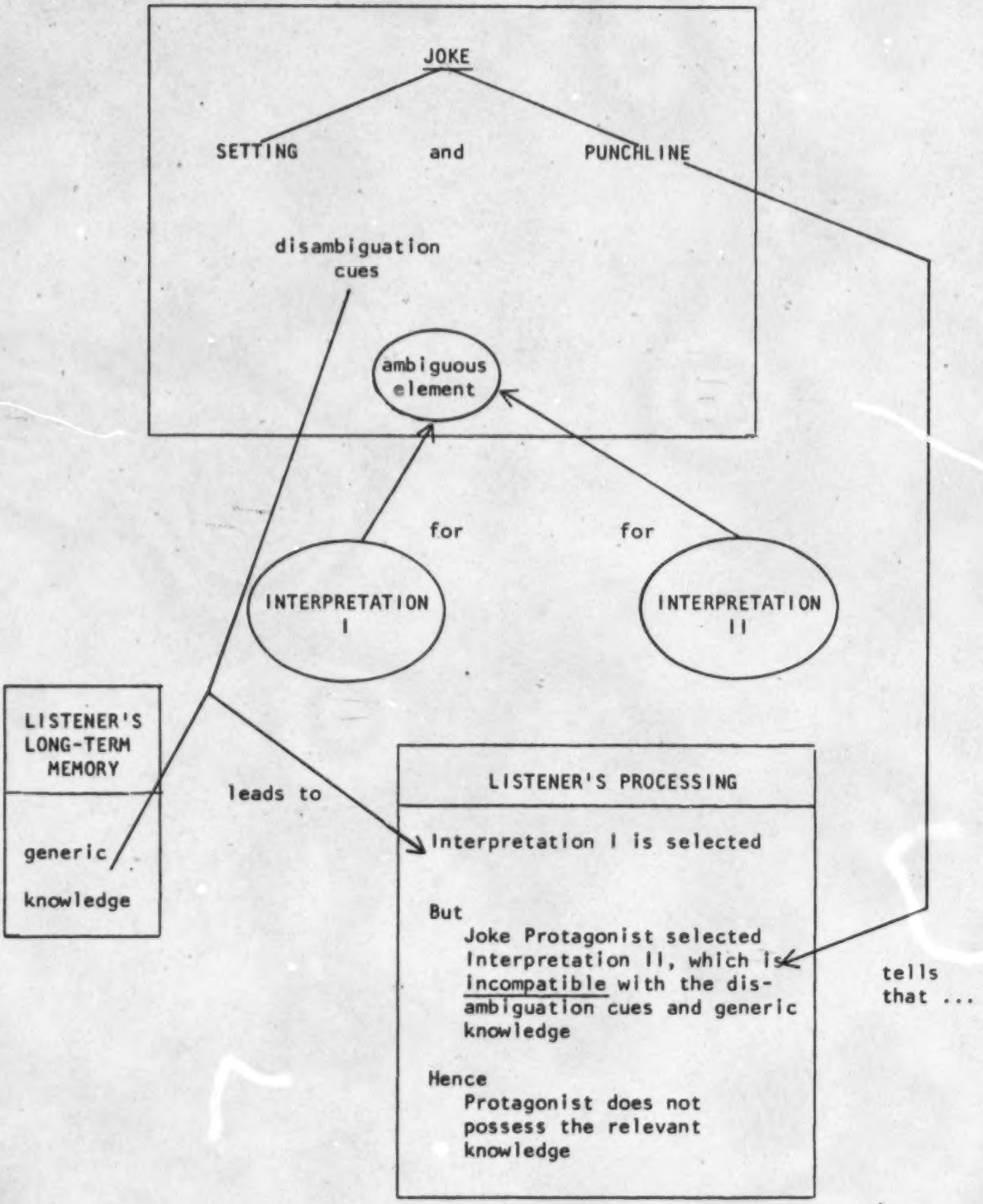
[1] In some cases the protagonist may be hidden, and his or her part may be acted by the teller. For example, in joke (5) the teller provides the answer that an imaginary protagonist with no feeling for reasonable proportions would have given.

Figure Caption

Figure 1. An outline of the structure of jokes and joke processing.


JOKE
SETTING
and
PUNCHLINE
disambiguation cues
ambiguous element
for
for
INTERPRETATION I
INTERPRETATION II
LISTENER'S LONG-TERM MEMORY
generic knowledge
leads to
LISTENER'S PROCESSING
Interpretation I is selected
But
Joke Protagonist selected Interpretation II, which is incompatible with the disambiguation cues and generic knowledge
Hence
Protagonist does not possess the relevant knowledge
tells that ...